

Claims

What is claimed is:

1. An apparatus for installing a vertebral implant assembly, having a tubular body and a pair of endplate assemblies, between two vertebral endplates, the apparatus comprising:
 - an axle having a proximal end and a distal end;
 - a set of gears connected to the proximal end of the axle; and
 - an engager device connected to the set of gears and adapted to rotate the tubular body when the axle is rotated,wherein the rotation of the tubular body expands the vertebral implant assembly.
2. The apparatus of claim 1 further comprising
 - an outer casing and
 - a handle section connected to the distal end of the axle,wherein the axle extends through the outer casing and at least partially into the handle.
3. The apparatus of claim 2 wherein the handle section is fixedly connected to the axle.
4. The apparatus of claim 2 wherein the handle section rotationally engages the outer casing.
5. The apparatus of claim 2 wherein the handle section comprises a first portion fixed to the outer casing and a second portion adapted to rotate the axle.
6. The apparatus of claim 2 further comprising a plurality of gears selectively engaged with the axle.

7. The apparatus of claim 6 further comprising a cap member movable about the handle section, wherein the cap member is adapted to select one or more of the plurality of gears to engage the axle.
8. The apparatus of claim 1 wherein the engager device comprises a toothed section configured to engage apertures on the vertebral implant assembly.
9. The apparatus of claim 1 wherein the engager device comprises a positioning mechanism for at least partially surrounding the vertebral implant assembly.
10. The apparatus of claim 9 wherein the positioning mechanism comprises a pair of selectively pivotable arc portions.
11. The apparatus of claim 8 wherein the set of gears comprises
a secondary gear assembly attached to the axle and
a gear section attached to the toothed section,
wherein the secondary gear assembly engages the gear section for translating rotation of the axle into rotation of the toothed section.
12. The apparatus of claim 1 further comprising:
an outer casing through which the axle extends, and
a holding instrument attached to the endplate assemblies of the vertebral implant assembly and further attached to the outer casing.
13. The apparatus of claim 11 wherein the holding instrument further comprises:
a pair of parallel alignment arms for the attachment to the endplate assemblies;
an attachment device for the attachment to the outer casing;
one or more expansion members extending between the attachment device and each alignment arm; and
an alignment member extending between the alignment arms for maintaining the parallel alignment of the alignment arms as the vertebral implant assembly expands.

14. A method for adjusting a vertebral implant assembly having a tubular body and a pair of endplate assemblies, the method comprising:

fixing the endplate assemblies to prevent rotation;

engaging an expander apparatus with the vertebral implant assembly, wherein the expander apparatus includes a set of gears connected between an axle and an implant engager device;

turning the axle; and

rotating the implant engager device, wherein rotating the engager device adjusts the vertebral implant assembly.

15. The method of claim 14 wherein the expander apparatus remains laterally fixed while adjusting the vertebral implant assembly.

16. The method of claim 14 further comprising:

moving the implant into a spinal column with the expander apparatus.

17. The method of claim 14 further comprising:

selecting from a plurality of gears to engage the axle, thereby adjusting the speed and torque of the rotating implant engager device.

18. The method of claim 17 further comprising:

moving a cap member about the handle to select from the plurality of gears.

19. The method of claim 14 wherein the implant engager device comprises a plurality of radially arranged teeth adapted to engage a plurality of radially arranged apertures on the tubular body and wherein the rotation of the implant engager device advances the teeth into the apertures and rotates the tubular body.

20. The method of claim 19 wherein the set of gears includes a first gear coupled to the axle and a second gear coupled to the implant engager and wherein the first gear is positioned perpendicular to and in contact with the second gear so that the rotation of the axle is translated into rotation of the implant engager device through the set of gears.

21. The method of claim 14 wherein fixing the endplate assemblies comprises attaching the endplate assemblies to a holding instrument fixedly attached to the expander apparatus and wherein the holding instrument prevents lateral movement of the vertebral implant assembly during the adjustment of the vertebral implant assembly.